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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,750	03/24/2004	Shyh-Nung Lin	006020	6533

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Patent Department, M/S 2061  
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USAC01/CPS/IBSS/LA

EXAMINER

BRUENJES, CHRISTOPHER P

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/807,750	Applicant(s) LIN ET AL.	
	Examiner Christopher P Bruenjes	Art Unit 1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 12-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-17 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>20040324</u> . | 6) <input type="checkbox"/> Other: ____.  |

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**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-11, drawn to a substrate processing chamber component, classified in class 428, subclass 34.4.

II. Claims 12-17, drawn to a method of making a component, classified in class 427, subclass 576.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another process such as depositing the ceramic coating by flame spraying rather than plasma spraying.

2. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by

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their different classification, restriction for examination purposes as indicated is proper.

3. During a telephone conversation with Ashok Janah on July 21, 2004 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-11. Affirmation of this election must be made by applicant in replying to this Office action. Claims 12-17 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

#### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple

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assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-11 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-35 of U.S. Patent No. 6,777,045.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of '045 teach a substrate processing chamber component such as a domed enclosure wall comprising a structure composed of aluminum oxide and having a roughened surface with a roughness average of from about 150 to about 450 microinches and a plasma sprayed ceramic coating deposited on the roughened surface of the structure composed of aluminum oxide. The coating comprises a porosity from about 5% to about 10% and a thickness between 1 mil and 8 mils.

#### ***Specification***

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6. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because the abstract contains legal phraseology such as "comprises".

Correction is required. See MPEP § 608.01(b).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United

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States and was published under Article 21(2) of such treaty in the English language.

7. Claims 9 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Chang et al (US 2002/0086118 A1).

Chang et al anticipate a domed enclosure wall for a substrate processing chamber (see abstract and Figure 3) comprising a structure composed of aluminum oxide or alumina (p.2 paragraph 21) and a plasma sprayed ceramic coating deposited on the surface of the structure composed of aluminum oxide or alumina (p.3, paragraph 29). The chamber walls included as suitable components inherently include at least a portion of a chamber ceiling.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for

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establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-2, 4-8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al (US 2002/0086118 A1).

Chang et al teach a substrate processing chamber component such as chamber walls (see abstract), which includes domed enclosure walls and at least a portion of a ceiling. The component comprises a structure composed of aluminum oxide or alumina (p.2 paragraph 21) having a roughened surface (p.3, paragraph 26). A plasma sprayed ceramic coating deposited on the surface of the structure composed of aluminum oxide or alumina (p.3, paragraph 29) have a roughness average of from about 150 to 190 microinches (p.2, paragraph 22). The thickness of the ceramic coating is between 2 mils and 5 mils (p.3, paragraph 29). The substrate processing chamber comprises a substrate support a process gas supply, a plasma generator to energize the process gas, and a gas exhaust (p.1, paragraph 4).

Chang et al fail to explicitly teach that the roughened surface of the structure has a roughness average of from about



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150 to about 450 microinches. However, Chang et al teach that surface of the structure is grit blasted in order to roughen the surface and that the roughened surface profile of the substrate resulting from the grit blasting can help promote mechanical keying or interlocking of the coating with the substrate (p.3, paragraph 26). Chang et al further teach that the final outside roughness of the coating is between 150 and 450 microinches.

One of ordinary skill in the art would have recognized that the roughened surface of the structure would be roughened an amount to maximize the bonding of the coating to the structure, as taught by Chang et al, and that the roughness value must be close to range of 150 to 450 microinches because textured surface of the ceramic coating has a roughness value between 150 to 190 microinches, as taught by Chang et al.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the applicant's invention was made to select the roughness value of the roughened surface of the structure of Chang et al within the range of 150 to 450 microinches, in order to maximize the bonding of the coating to the structure while still allowing the textured surface of the ceramic coating to have a roughness value between 150 and 190 microinches, as taught by Chang et al.

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9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al (US 2002/0086118 A1) in view of Levinstein et al (USPN 4,419,201).

Chang et al teaches all that is claimed in claim 1, but fails to explicitly teach that the plasma sprayed ceramic coating comprises a porosity of from about 5% to about 10%. However, Levinstein teaches that a plasma sprayed ceramic coating comprised of aluminum oxide (col. 4, lines 52-55), that is applied to a dielectric material comprising ceramics (col. 4, lines 42-45), used in a plasma processing chamber (col.4, lines 30-34) comprises a low porosity (col. 4, lines 45-51) in order to provide good adherence (col. 4, line 47-48). Levinstein only provides that the porosity is low and not an exact percentage such as 5%-10%. The claimed porosity would be readily determined through routine experimentation by one having ordinary skill in the art and would be obvious in Levinstein depending on the desired optimum porosity absence of showing new and unexpected results. In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980). Therefore, one of ordinary skill in the art would have recognized that the plasma sprayed ceramic coating comprises a low porosity, which encompasses the claimed 5% to 10% as described above for the purpose of providing good adherence as taught by Levinstein (col. 4, lines 45-48).

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Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a plasma sprayed ceramic coating comprising a low porosity, such as 5% to 10% in Chang et al in order to provide good adherence as taught by Levinstein.

10. Claims 1-2 and 4-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shih et al (USPN 6,120,640) in view of Akiyama et al (USPN 6,152,071).

Shih teaches a domed enclosure wall for a plasma processing chamber (Fig. 1) that comprises a dielectric material comprising a roughened surface having a roughness average of 100 to 300 microinches (col. 8-9, lines 54-4) and a plasma sprayed ceramic coating (col.7, lines 6-10 and 21) deposited on the roughened surface of the dielectric material, the plasma sprayed ceramic coating comprising a textured exposed surface having a roughness average of 100 to 300 microinches (Figs. 7-8 and col. 9, lines 23-26), whereby sputtered material generated by a plasma in a plasma processing chamber may adhere to the textured exposed surface. The dielectric material comprises a ceramic material, which comprises aluminum oxide or "anodized aluminum" (abstract and col. 6, lines 61).

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Shih fails to explicitly teach coating the dielectric material with a ceramic composed of aluminum oxide or titanium oxide. However, Akiyama teaches that the surface of a plasma sprayed ceramic coating applied to a substrate is roughened in order to prevent peeling of the deposition film from the chamber wall (col. 14, lines 36-45). Akiyama also teaches that the plasma sprayed ceramic coating comprises aluminum oxide or titanium oxide in order to prevent peeling of the deposition film (col. 14, lines 24-32). Therefore, one of ordinary skill in the art would have recognized that a roughened plasma sprayed ceramic coating comprising aluminum oxide or titanium oxide is substituted for a plasma sprayed ceramic coating comprising boron carbide in order to prevent the peeling of the deposition film from the chamber wall as taught by Akiyama.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Akiyama's roughened plasma sprayed ceramic coating comprising aluminum oxide or titanium oxide for Shih's plasma sprayed ceramic coating comprising boron carbide in order to prevent the peeling of the deposition film as taught by Akiyama.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shih et al (USPN 6,120,640) in view of Akiyama

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et al (USPN 6,152,071) as applied to claim 1 above, and further in view of Levinstein et al (USPN 4,419,201).

Shih and Akiyama taken as a whole teach all that is claimed in claim 1, but fails to explicitly teach that the plasma sprayed ceramic coating comprises a porosity of from about 5% to about 10%. However, Levinstein teaches that a plasma sprayed ceramic coating comprised of aluminum oxide (col. 4, lines 52-55), that is applied to a dielectric material comprising ceramics (col. 4, lines 42-45), used in a plasma processing chamber (col.4, lines 30-34) comprises a low porosity (col. 4, lines 45-51) in order to provide good adherence (col. 4, line 47-48). Levinstein only provides that the porosity is low and not an exact percentage such as 5%-10%. The claimed porosity would be readily determined through routine experimentation by one having ordinary skill in the art and would be obvious in Levinstein depending on the desired optimum porosity absence of showing new and unexpected results. In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980). Therefore, one of ordinary skill in the art would have recognized that the plasma sprayed ceramic coating comprises a low porosity, which encompasses the claimed 5% to 10% as described above for the purpose of providing good adherence as taught by Levinstein (col. 4, lines 45-48).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a plasma sprayed ceramic coating comprising a low porosity, such as 5% to 10% in Shih and Akiyama combined in order to provide good adherence as taught by Levinstein.

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ding et al (EP 0 845 545 A1); Richardson et al (USPN 5,916,454); Robertson et al (USPN 5,366,585); Yin et al (USPN 6,379,575).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher P Bruenjes whose telephone number is 571-272-1489. The examiner can normally be reached on Monday thru Friday from 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Christopher P Bruenjes  
Examiner  
Art Unit 1772

CPB

August 17, 2004

  
HAROLD PYON  
SUPERVISORY PATENT EXAMINER  
1772

8/20/04